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ABSTRACT

This paper addresses opportunities and issues related to the use of the World Wide Web and high-speed networks as a delivery vehicle for training educators who are geographically dispersed. The benefits and potential pitfalls of using networks as educational platforms are explored from the perspective of various systems specifically being developed to address the needs of practicing professionals in North Carolina and North Dakota. The projects described are: (1) the INSTRUCT (Implementing the NCTM School Teaching Recommendations Using Collaborative Telecommunications) Project of the Department of Mathematics and Statistics at the University of North Carolina at Wilmington; (2) the DLD/M (Distance Learning Design/Model) Project of the North Carolina Community College System; (3) the North Dakota Teach-to-Learn program; (4) the statewide laptop program in North Dakota; and (5) the North Dakota TnT (Teachers and Technology) workshops and conferences. An overview of each project is followed by a discussion of common issues, including a notion of future prospects for network-based professional development. (Contains 15 references.) (MES)

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Network-based Professional Development: A Comparison of Statewide Initiatives

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Abstract: This paper addresses opportunities and issues related to the use of the World Wide Web and high-speed networks as a delivery vehicle for training educators who are geographically dispersed. The benefits and potential pitfalls of using networks as educational platforms are explored from the perspective of various systems specifically being developed to address the needs of practicing professionals in North Carolina and North Dakota. An overview of each of the projects is followed by a discussion of common issues among the projects, including a notion of future prospects for network-based professional development.

Introduction

Professional development in education is in an exciting period of challenge and change as we enter the twenty-first century. The realization of just-in-time distance training for educators is within reach, thanks largely to the ubiquity of the World Wide Web and increasing access to high-speed networks. States such as North Carolina and North Dakota benefit greatly from this type of training, which directly addresses the difficulty of reaching educators who are geographically dispersed in rural areas. This paper discusses initiatives in these states that impact instructors from the elementary level through community college and four-year colleges and universities. As [Fig. 1] illustrates, there are unique aspects as well as commonalties among these diverse programs. This paper will present the projects separately, and then conclude with a discussion of the intersection of these programs and what those common issues might indicate about the future of network-based professional development.

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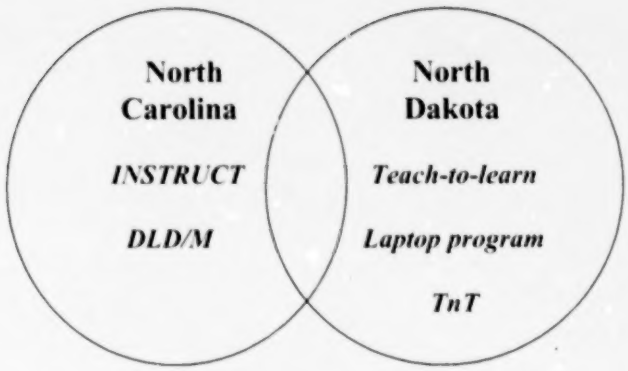

Figure 1: Network-based Professional Development Projects

The INSTRUCT Project

The Department of Mathematics and Statistics at the University of North Carolina at Wilmington has developed a teacher training Web site called INSTRUCT, which stands for *I*mplementing the *N*CTM *S*chool *T*eaching *R*ecommendations *U*sing *C*ollaborative *T*elecommunications. The site is located at http://instruct.cms.uncwil.edu. Since 1996, the site has been used by over 30 teachers from southeastern North Carolina to complete training at a distance that resulted in both licensure renewal credit from the state and technology credit from local school districts.

For the 1999-2000 school year, INSTRUCT is part of a statewide effort called Education Future Now (NOW), coordinated by the North Carolina School of Science and Mathematics (NCSSM). NCSSM has received a $6.5 million Technology Challenge grant from the U.S. Department of Education to address the need for technology training of the North Carolina's K-12 teachers. A major component of NOW will be distance training, which will be carried over both the Web and two-way videoconferencing using seven locations across the state. As a part of NOW, the INSTRUCT program is being offered to up to 35 middle and high school mathematics teachers who have access to the Web. Those not teaching in North Carolina have the opportunity to participate in the program with no guarantee of stipend or licensure renewal credit. The site's resources are available for anyone to use, though to receive renewal credit teachers must be enrolled in the program.

The site contains the following major components:

1. A hypermedia version of the NCTM Standards for Teaching Mathematics contained in the *Professional Standards for Teaching Mathematics* [NCTM 1991], which includes such topics as Worthwhile Mathematical Tasks, Tools for Enhancing Discourse, and Analysis of Teaching and Learning;
2. Online educational resources that cover a wide variety of resource categories, such as Geometry and chaos, Internet project ideas, Lesson planning resources, Statistical data sources, Technology and Web publishing resources, as well as direct links to the state and national agencies;
3. A discussion and meeting area which uses WebBoard™ for posting discussion items or chatting online. The discussion board is open to the public; however, users must register to be added to the access list for chats.

Except for an initial two-way videoconference on navigating the Web and familiarization with Web-based communications tools, all training is conducted over the Web during a single semester. Teachers may opt to participate from either school or home. The INSTRUCT program takes approximately 12 weeks to complete, for a total of 30 online hours and 12 offline hours. During this time, teachers are expected to review hypermedia standards materials, participate in one chat per week, and carry out an ongoing implementation of the standards in their classrooms. Products of the implementation effort include lesson plans and activities reflective of both the NCTM standards and the North Carolina Standard Course of Study, as well as Check for Understanding forms submitted upon completion of each standard. Stipends for participation are made available through various grant awards.

Results from the project to date indicate that not only are teacher practices changing during the semester they are involved with the program, but those changes tend to persist once training is complete. In particular, teachers have noted their willingness to continue trying out ideas presented in the standards material, while at the same time regularly availing themselves of the online resources for mathematics teachers contained on the INSTRUCT site. Each semester, INSTRUCT participants point to the weekly chats they are involved in as the most unique and essential feature of the training, primarily because it keeps them in regular contact with their colleagues in a profession that is often very isolating. Participant comments include: "I enjoyed chatting and sharing ideas with other teachers the most. I don't feel so alone when I know others are experiencing the same things I am" and "I truly enjoyed the on line chats weekly. I think the ability to discuss weekly with other teachers that are working on the ideas that you are trying in your classroom was the most valuable."

In addition, for the last two years a small group of participants have volunteered to continue chatting during spring semester. Each year, one of these chats includes preservice teachers who are preparing to begin their practicum semester. The practicing teachers find the discussion stimulating because of the prospective teacher's enthusiasm, and the preservice teachers have the unique opportunity to ask veteran teachers about their concerns as they look forward to teaching. Nevertheless, the numbers of teachers voluntarily participating in chats once the primary training is complete represents only a fraction of the total number of participants. There is a strong sense that if teachers are not being compensated for their time, either through stipend or licensure renewal credit, it is simply unrealistic for them to make such a time-consuming commitment.

North Dakota Projects

Successful teacher inservice efforts in North Dakota are those that have continued and sustained programs teachers can count on for support when needed. One example is the Teach-to-Learn program. Teachers train teachers in the Teach-to-Learn Model. A Web site contains a database whereby a teacher can post the purpose and time for an evening workshop for others teachers to enroll online. The dependability of this system is illustrated by one second-grade teacher who stated, "Very little time is available for practice in the elementary classroom, that is, to sit down at the computer to practice such simple things as checking for e-mail. So I signed up for the same Teach-to-Learn topic three times until I mastered all the techniques. Learning along with fellow teachers is so important because we all have the same time restraints when tending to students during the school day." Although it was found that immersion with students and teachers is most productive for implementing training in instructional uses of technology, learning to utilize such classroom management technologies requires dependable forums to collaborate with peers.

The statewide laptop program supported by the USWEST initiative for all western states supported this view when data were collected from the 100 participating teachers in North Dakota. The initial workshop training evaluation scores were excellent. Teachers left training knowing how to use the laptop for networking. In the long run it was the bonding during the summer classroom sessions that prompted continued communications through a Listserv connection that provided sustained collaboration among peers. This continued self-enhanced activity was essential for growth and advanced computer utilization.

The same is true regarding the online network for school district instructional technology coordinators and directors. Their continued collaboration through online e-mail discussions and monthly meetings over the statewide Interactive Video Network has enhanced growth and expertise through peer support. These groups collaborated to develop successful regional workshops and a well-attended, weeklong conference held each June called TnT after Teachers and Technology.

The assessments clearly show that the advancements in North Dakota are teacher-based and not necessarily school-based. This means computer technology is not yet an integral part of the practiced curricula. This can best be portrayed by the following qualitative summary: "Our high school is deemed to be one of the most technologically enhanced in our state. It also appears to equal any technologically enriched 10-12 system in the nation, however, it is still possible for students to select a sequence of courses for their entire high school career and not be involved in these technologically-enhanced instructional opportunities we are known to provide learners. This is possible because teachers in every department have not changed despite being trained alongside peers who are models regarding exceptional integration of classroom technology."

Thus, as more and more teachers are learning and re-learning how to utilize computer-based technologies in their classrooms, there is also a need to increase the extent to which teachers are utilizing and extending the use of computers for instructional purposes on an across-the-curriculum basis to reach all learners. The answer for this sparsely populated state with 6,280 K-12 teachers is a $7 million Department of Education Teacher Technology Training grant, which focuses on an intensive effort to continue to prepare teachers for classroom uses of computers during the next four years. This grant resulted from collaborative efforts, which had the capacity to deliver due to previously successful endeavors. This new initiative combines the Center for Innovation in Instruction and the State Board for Vocational Education in a process that selects regional trainers to work with new trainers, along with the teachers who will be receiving this training. Concurrently, state funds, Goals 2000 funds, and School-to-Work grants supplement specialized efforts to support and train select groups of teachers on how to employ specialized computer programs for classroom use.

The North Carolina Community College System DLD/M Project

The Distance Learning Design/Model (DLD/M) Project was funded to address the system-wide distance education needs of the North Carolina Community College System (NCCCS). DLD/M project activities started in October 1998 and ended in May 1999. The primary goal of the DLD/M project was to produce a plan to develop a training program that addresses NCCCS faculty/administrative training goals, and the competencies and infrastructure needed to prepare institutions to deliver distance education. Project outcomes include the development of a planning/training document, a design model, a set of distance learning resources on the Internet, and marketing material(s).

Topics and issues covered within the scope of the DLD/M project include: organizational and administrative design; curriculum design; team-building and personnel considerations; marketing and recruiting plans; student service concerns; and technological considerations of distance education. Since individual community colleges are already engaged in the design, development, and delivery of distance learning courses, we formed an Advisory Board with members representing 12 different community colleges around the state. The advisory board members actively contributed to the development of this project.

For this project, a Training and Needs Assessment Survey instrument was given to faculty, staff, and administrators at eight NCCCS institutions in February 1999. The survey was administered to ten individuals who were selected at each of the eight community college sites by the Advisory Board member affiliated with the community college. When asked if they had ever taken part in distance education training, we found that the responses ranged from 100% to 30%. This shows that distance education training currently varies widely from institution to institution. More significant is that fact that more than

80% of respondents on average would like to take part in distance education training. Perhaps even more surprisingly, respondents stated overwhelmingly that they wanted two or more days of training.

A few respondents indicated that they have already participated in designing, developing, and/or offering telecourses (mostly asynchronous in nature), North Carolina Information Highway courses (synchronous two-way video, time/place bound), and/or Internet-based courses (combination of asynchronous and synchronous). Surprisingly, when asked what they were most interested in working with in the future, most respondents indicated a strong preference for Internet-based courses over telecourses and NCIH courses. This result, taken along with the trend around the country to offer Web-based asynchronous rather than two-way video synchronous courses, indicates that instructor training is most needed in the area of Internet-based course development. For this reason, we emphasized online, Web-based instructional technology competencies/skill sets in our instructor online course development and training plan.

What follows are the training modules that were derived from a list of online teaching competencies/skill sets for NC Community College Instructors as developed from an extensive literature review as well as comments solicited from experts in the field of distance education. These training modules are intended to prepare NC Community College instructors to develop and deliver high quality education at a distance (details of individual training modules have been omitted due to space restrictions; however, a more detailed report can be viewed at http://www.uncwil.edu/people/vetterr/ncccs/).

I. Basic Internet Competencies

A. Unit 1: Introduction to the Internet and Email Use
B. Unit 2: Internet Browsers
C. Unit 3: Research and the Internet
D. Unit 4: Authoring on the Web

II. Using the Internet for Instruction

A. Unit 1: Intro to Teaching Online
B. Unit 2: Administration of Online Courses
C. Unit 3: Course Planning and Organization (Instructional design/pedagogy)
D. Unit 4: Tools for Online Courses

III. Advanced Internet Instruction

A. Unit 1: Advanced Technical Competencies
B. Unit 2: Advanced Multimedia for Internet Instruction

Comprehensive system-wide recommendations for NC community colleges included development of a Distance Education Faculty and Staff Development Center, a competitive grants program for collaborative online course development activities that span across multiple institutions, and a detailed list of competencies/skill sets for two-way interactive video courses (NCIH courses) as well as for telecourses.

Common Issues and Future Prospects

We believe the experiences and lessons learned from the network-based teacher professional development projects described in this paper can be successfully adapted to the needs of other states as well. Already today, the explosive growth of the Web and access to high-speed networks are having a dramatic effect on the way educators view professional development.

We see an increasing role for the hybrid use of synchronous two-way interactive video with asynchronous Internet-based learning systems. This combination provides considerable flexibility (as well as reduced network costs) for the instructor, student, and institution. In addition, as IP-based video systems become more widely available (for example, Microsoft's Netmeeting software system), the need for expensive classrooms with high quality video capabilities will diminish, at least in terms of providing distance educational opportunities to students.

[Shotsberger 1999] notes three distinct advantages of Web-based professional development, which could be extended to include the hybrid model just mentioned:

1. Consistent opportunities for reflection and sharing with colleagues;
2. Shortened cycle for training, implementation and evaluation of new practices;
3. Teacher empowerment through direct access to information.

Teachers are already embracing the World Wide Web in increasing numbers, making the process of training at a distance that much simpler. As the Web continues to mature and evolve in the next few years, enhanced network and software technologies needed for carrying out effective group and collaborative work applications will hopefully encourage greater teacher participation in network-based professional development.

During an intensive, summer-long, faculty-centered Web-based course development effort, [Vetter, Lugo & Ward 1998] discovered that the thought process involved in putting a course online was itself a good model for professional development as it encouraged faculty to re-think the way they teach, interact with other faculty, and develop the support systems needed to retain skills learned. We need to re-think faculty professional development with more emphasis on teaching and learning outcomes, and focus on collaborative development (Web teams, collective reviews and assessments) as a model of learning organization.

In addition, the transition from print-based learning materials to electronic, interactive, nonlinear, network-based learning modules requires further investigation and study [Sologuk, Stammen & Vetter]. Writing professional development Web pages requires a very different style and more dynamic presentation. For example, online materials must be designed with navigational links built in to them and organized in an easy-to-follow fashion. Techniques for creating effective paper-based professional development materials are already well developed. Additional research is required to develop efficient techniques for going from static paper-based models to dynamic electronic-based models.

In the near future, we expect network-based instructional software technologies will mature to the point where many of these issues are satisfactorily addressed. In particular, we expect to see the standardization of instructional systems and knowledge content, improved instructional Web page design, and an increase in software support for collaborative, team-based, teacher training models.

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